like 'objective value of experiences that change distribution.

The Importance of Being Unsure ("Don't be so sure of yourself.")

(We don't always want to say that an experiment or observation has
no value, or little value, for a person who is sure of distribution,
and sure that observation will not affect it; we may have objective,
UNCERTAINTY   though non-specific, reasons for thinking he is wrong;
           e.g., conflict with otheropinions, lack of experience.

1. Problem: why are committees more trusted than individual decision-
maker? What are the possible goodt aspects of committee decision-
making? (e.g., exposure to opposing points of view reduces unwarranted
assurance , may lead to uncertainty-like behavior such as experiment,
observation, even though individuals retain their own subjective
probability distributions. Thus, aside from effect of bringing more
information to bear on problem than any one person possessed initially--
thus possibly changing all of their individual prob distributions and
bringing them into harmony--the committee effect may be to (a) gather
information (where individuals would not have thought this necessary
before; now they do, either because they are now less certain, or because
this is the only way to achieve group decision); (b) on basis of given
information and individual prob dists, may favor certain distributions,
on basis of certain decision rules (Question: why are these rules
favored by committees? Whenx and why are they "good"?)

2. Note similarity of behavior induced by: a) subjective uncertainty
(ignorance); (b) disagreement among members of a committee, and need for
group decision. At least, behavior is similar if it is possible to
search, experiment, gather information. Hypothesis: also similar
normative decision rules on basis of given information.   Latter rules
may be "desirable" precisely becausethey tend to favor information-
xxx seeking actions when one is "ignorant" (or when actual disagreement
occurs). (Note importance of choosing members of committee: in sucha
way that situations of disagreement are likely to correspond to
"situations in which search behavior and/or group decision rule are
likely to lead to better results than would the absence of search
behavior or the decision rule followed by an individual chosen at
random from the committee.")
     Concept of committee: common payoffs, possibly differing infor-
ationx and subjective probabilities.

3. Similar problem to "value of committee decision" is "value of
gaming" as heuristic device; value might, in some cases, be that it
reduces certainty, assurance. This may reduce decisiveness, favor
postponing actions or status quo actions (which may or may not be
good); may also encourage information-gathering actions.

4. Various possibilities on committe: a) all members agree on s
subjective prob dist, vN-M payoffs (didn't need committee; aspect
doesn't affect decision, though it might reassure person who convened
committee); b) each one is certain as to state of nature that will
obtain, but all disagree (all might agree on quick, cheap observation
to determine group choice); (c) they have various probability distrib
utions over states of nature; (d) they have varying degrees of con-
fidencein their estimates; certain types of information might affect
either their estimate or their confidence, or both, perhaps in
differing directions.

*The 'need to prove, to convince' leads to search for evidence; may lead one to
reexamine beliefs, consider new evidence.*

5.   Distinguish between: a) situation betweex in which many reasomble
individuals do disagree, or could be predicted (on basis of some theory
and certain evidence) to disagree; or in which information is known
to be scanty, vague, unreliable or conflicting; and (b) situation in
which an indivudual or many individuals experience or report or give
evidence of low confidence in estimates, "wide confidence intervals,"
ignorance, etc; (c) situations in which individuals have estimates
with great variance in their probability distributions, great "risk," etc

These three may be considerably correlated; and certain types of
behavior may be common, or appro riate, for all three. But for some
purposes they must be distinguished.
(e.g., in case (a) it might be "appro riate," on bax pragmatic
fx basis in certain sort of situation, for individuals to act as
if they were in case (b) or case (c), even if they "aren't."

6.   Value of information: relative to particular actions considered,
particular evaluation of states of the world ("consequences"--payoff
function).
Consider action (which may be "objectively" defined) as mapping
events into consequences, or given states of the world into other
states of the world. A payoff function evaluates states of the world
in terms of a particular problem, emphasizing certain dimensions and
ignoring others (i.e., partitioning into equivalence classes, showing
indifference w.r.t. "irrelevant" dimensions). In decision-making
problem, certain set of actions are given, and payoff function is
given.
If we think of decision as "deduction from premises"--outcomes,
values, likelihoods--then a "message" or experiment, etc., might affect
any of these premises. But if payoff function and set of actions are
considered constant, or given, then messages or information will only
affect likelihoods.
Do we want to say that a message which couldn't affect decision
has no value? (or that a message that didn't affect decision had no
value?) If action A dominates B, and these are only available actions,
then no information on likelihoods could have value--with respect to
this decision-making problem. But if action C becomes available,
neither dominating nor dominated by A, then information could be
valuable. And if the payoff function sho ld change (depends on person,
problem situation, occasion) A might no longer dominate B, so info
could be valuable. And if a different problem were considered, in
which actions D, E, F were concerned, the earlier message might be
valuable.
Thus, value of information will be relative to: a) the acts
considered (defined by their outcomes); (b) the payoff function
evaluating outcomes. The first will depend on problem, person, si
tuation; the second on person, occasion.
How about messages that affect payoff function? (Aside from
those that do so by affecting subjective probs, etc., over states
of the world; i.e., that affect evaluation of certain states of
the world in terms of higher criteria, by affecting understanding
of interrelationships, probabilities). What is the "meaning," the
"information content" of these? How is their "value" measured?

It will also be useful to have a measure of the effect of message
on likelihoods even if itmay not affect decision in particular
problem; it could affect other decisions, if payoff function or
set of alternatives differed; thus, "value" of info to a scientis
t might require special measurement.

7. Distinguish between "ex post" and "ex ante" measures of
value of information; and between value as foreseen or experienced
by subject and as foreseen or experx determined by observer.
    a) subject may foresee little change, or non-critical change
in his expectations; but he may experience decisive change ex post.
Observer may know that subject's expectations are wrong, and will
be affected by experiment; or more likely, observer may know that
one of subjects' beliefs are wrong (at least), and that experime
nt will provide basis for agreement, and for choice by observer.
    (On problem of using experts, see Helmer))

8. Relation of "value of information" or "information content"
to "meaning." Note that a certain message may be spxxeuxmx
convey no information (because redundant) without being meaning-
less. (Though redundancy may increase confidence, though witha
affecting relative likelihoods, thus without affecting measure
of "quantity of information").

9. The essential feature of Knight's "risk situations" may be
that they are situations in which increments of information,
experiments, observations, etc., have no value w.r.t. tm the set
of actions and the payoff function considered; just as in
subjective certainty. "Surprise" is considered impossible (or
in practice, unlikely); additional information will not affect
the assignment of probabilities; at least, to a point that migh
affect decision, whose consequences depend only on "gross" aspet
of the prob distribution anyways (e.g., expected value).
    By contrast: in Knight's "uncertainty" situations, additional
information, experiments, search, etc. could greatly affect
individual's "IMAGE," his subjective probabilities. "Surprise"
is not considered unlikely (and is, objectively, "likely," even
if individual does not perceive this--in many cases).

10. Objectively, we can compute value to team or committee of
allowing or forcing a particular member to reseive make an
observation or experiment, receive a message, etc. Compare value of
letting commander make decision on basis of observations transmitted
to him,x with costs of delays--as compared to operating on plan, or
letting subordinates make decisions on basis of partial information.
    Spasm war exponents see alternatives, outcomes, payoffs as such
as to give make wartime information (beyond fact of attack) "worth
very little" to a commander who had made a good pre-hostilities
plan. But can disagree with their view of a) alternatives, (b)
payoffs over outcomes; hence, with their view of the value of
information and the desirabil ty of centralized decision-making and
sequential decision-making.

11. Can imagine continuing observation, experimentation, etc. untl
further messages (a) can convey no additional information, or unti
(b) messages have are not "worth" their "cost," which may be high.
((Example of first: a well-balanced roulette wheel; no sequential
decision rule is better than any other, or better than strategy
based on no observations)).
    Fact that decisions are, or must be, sometimes made under
ignorance, with surprise still possible, implies that experiment
has not been continued to this point (a), orthat costs of observation
(including costs of delaying decision) are so high that observation
must be suspended although additional ones could still convey much
info.

12. Simon assumes very simply structuredpayoffs-- "acceptable"
or "not acceptable"--so that information states are simply divided
into those in which information has"very high" (how high?) value, and
those in which information has zero value (depending whether or not
at least one available action carries "acceptable" expectation); hence,
behavior has two modes,"searching"and "sticking."

13. "I PRAy you, consider that you may be mistaken." (quote?)
But: to what effect? How should that possibility affect my
actions? Must I give it a definite probability? And what weight
do I give the various ways I may be mistaken?
     It may lead to search behavior: but: How long should I search?
How much should I be willing to pay to search? How do I compare one
method of search to another?

14. MinimaxxIn Members of committee all have (by assumption) same
payoffs, so all estimates will tend to be wishful in situation of
ignorance (or, situations where they disagree) (this must mean: biased
in such a way as to allow "best action" under resulting likelihoods
to have "acceptable" or "good" expectation). Taking, or weighting
more heavily, the most pessimistic (least optimistic) of these estim
ates may be a way of compensating for systematic bias.
     Consider forming estimate of cost in R&D project.

15. Distinguish between the way people tend to act under ignorane
(e.g., wishfully) and the way they "should" act, or act when
trying to be "rational" (orthe way a committee acts, which may
amount to same thing).

16. Value to decision-maker of forming committee of advisors;
counteract tendency of individual advisor to suppress uncertainty
prejudicial to what advisor thinks is "best decision." Committee
may reveal uncertainties, let decision-maker respond to them; or
may at least present estimates or advise "best decision" that
reflect consciousness (by them) of uncertainties.